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The LUCID-2 detector

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The LUCID-2 detector is the main online and offline luminosity provider of the ATLAS experiment. It provides over 100 different luminosity measurements from different algorithms for each of the 2808 LHC bunches. LUCID was entirely redesigned in preparation for LHC Run 2: both the detector and the electronics were upgraded in order to cope with the challenging conditions expected at the LHC center of mass energy of 13 TeV with only 25 ns bunch-spacing. While LUCID-1 used gas as a Cherenkov medium, the LUCID-2 detector is in a new unique way using the quartz windows of small photomultipliers as the Cherenkov medium. The main challenge for a luminometer is to keep the efficiency constant during years of data-taking. LUCID-2 is using an innovative calibration system based on radioactive ^{207}Bi sources deposited on the quartz window of the readout photomultipliers. This makes it possible to accurately monitor and control the gain of the photomultipliers so that the detector efficiency can be kept stable at a percent level. A description of the detector and its readout electronics will be given, as well as preliminary results on the ATLAS luminosity measurement and related systematic uncertainties.

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